INDEX

A

Acarnus erithacus, components of axial filament of, 689
Acclimation in cricket frogs, 332
ACHE, B. W., AND D. DAVENPORT. The sensory basis of host recognition by symbiotic shrimps, genus *Betaeus*, 94
Acris crepitans, metabolic rate of, 332
Adaptation in cricket frogs, 332
ADELMAN, W. J., JR., AND J. P. SENFT. Further evidence for potassium concentration changes in the periaxonal space of the squid giant axon, 454
Aequorin, measurement of $[Ca^{++}]_{in}$ of *Limulus* photoreceptors with, 456
Aestivation in tropical snails, 304
Algae, extracellular products of, 265
  response of bacteria to, 265
Alpha-chymotrypsin, inactivation of, 605
Amebocytes, aggregation of, in horseshoe crab, 548
Amino acid analyses, 467
Amphipods, effects of fuel oil on, 475
Ampullariidae, temperature, water and respiratory regimes in, 304
Amputation of gastropod proboscis, 317
Anaerobic conditions, survival of dark mutant bacteria in, 458
Anemones, behavior, 440
  respiratory adaptation of, 657
Anions, indicator, binding of, 468
Annual Report of the Marine Biological Laboratory, 1
Anoxia in sea anemones, 657
ANTONELLIS, B. C. See R. C. RUSTAD, 474
Ants, carpenter, detection of ionizing radiations by, 403
APLEY, M. L. See W. D. RUSSELL-HUNTER, 623
Arbacia eggs, developmental potential of, 479
  inhibition of development of, 474
  pigment granule movements in, 455
Arbacia fertilization, delay of, 456
Arbacia punctulata, cilia, pressure action on, 256
  hyperbaric oxygen and development in, 344
  sperm-egg interactions in, 465
  spermatozoa, 466
Ascidian hemagglutinin, 140
Asterias forbesi, developmental potential of, 479
  temperature acclimation in, 472
Aster-like structures in homogenates of *Spisula solidissima* oocytes, 480
Axial filaments of sponge spicules, 689
Axon, squid, effect of oxygen tension on, 477
  fluorescence of, 457
  membrane protein subunits from, 462
  potassium concentration in periaxonal space of, 454
  sulfhydryl reagents in, 469
Axon fluorescence, change in, 475

B

Bacteria, bioluminescent, characterization of, 469
  bioluminescent, survival of, 459
  genetic information transfer in, 473
  luminous, dark mutants of, 471
  luminous, survival of dark mutants of, 458
  marine, response to algae, 265
Bacteriophage, marine, isolation and host range studies of, 463
BAGCHI, M. See C. V. HARDING, 465
Balanus, receptor potential in photoreceptors of, 460
Balanus eburneus photoreceptors, luminescence in, 456
BANKS, J. See D. R. SHANKLIN, 477
BARBA, R. See G. T. REYNOLDS, 474
BARLOW, R. B., JR., AND E. KAPLAN. *Limulus polyphemus:* a true Cyclops, 454
BARRETT, D. See R. F. BRUNHOUSE, 456; B. F. EDWARDS, 459
BAST, R. E. See L. R. GANION, 463
BDZIL, J. B. See S. C. BROWN, 278
BEEBE-CENTER, R. See D. M. SANDBERG, 475
BELAMARICH, F. A. See D. M. KENNEY, 548
BELANGER, A. M., AND R. C. RUSTAD. Pigment granule movements in *Arbacia* eggs treated with cytochalasin B and colcemid, 455
BELL, W., AND R. MITCHELL. Chemotactic and growth responses of marine bacteria to algal extracellular products, 265
BERGER, E. M. The distribution of genetic variation in three species of *Littorina*, 455
Beta-chymotrypsin, inactivation of, 605
Beta radiation detection by carpenter ants, 403
Betaeus, host recognition, 94
Biochemistry of sea urchin hatching enzymes, 459
Bioluminescence in bacteria, 469, 471
  in marine dinoflagellates, 196
  in *Pelagia*, 470
Bioluminescent organisms, study of, 474
Biomechanics of annelid integument, 278
Biorhythms in an isopod, 568
  in salt-marsh snail, *Melampus*, 623
Bivalve spatial distribution, 175
BLINKS, J. R. See J. E. BROWN, 456

Borgese, T. A. Disc-gel electrophoresis of fish hemoglobins, 455
Borisy, G. G. See R. C. Weisenberg, 480
Botos, P., Jr. See G. T. Reynolds, 474
Boyer, J. F. See R. Milkman, 470
Brachyura ecdysis stimulated by limb loss, 222
Brown, B. See D. M. Sandberg, 475
Brown, J. E., and J. R. Blinks. Changes in $[Ca^{++}]_{in}$ of *Limulus* ventral photoreceptors measured with aequorin, 456
See L. H. Pinto, 473
Brown, S. C., J. B. Bdzil and H. L. Frisch. Responses of *Chaetopterus variopedatus* to osmotic stress, with a discussion of the mechanism of isoosmotic volume-regulation, 278
Brummett, A. R., and W. B. Vernberg. Oxygen consumption in anterior *versus* posterior embryonic shield of *Fundulus heteroclitus*, 296
Bruner, W. E. See E. L. Kean, 466
Brunhouse, R. F., P. Mounts and D. Barrett. Delay of fertilization in *Arbacia* by cytochalasin B treatment, 456
Bufo marinus, effect of extracellular ions on retina of, 473
Burky, A. J., J. Pacheco and E. Pereyra. Temperature, water and respiratory regimes of an amphibious snail, *Pomacea urceus* (Müller), from the Venezuelan savannah, 304

C

Calcium, binding in molluscs, 506
ions in myoblast fusion, 431
storage structures, 568
Callinectes, retinular cells in, 471
Campanotus herculeanus, detection of ionizing radiations by, 403
Campanularia flexuosa, fertilization in, 472
Cancer magister, hypoxia and circulation in, 247
Carbon dioxide output in cleaving frog eggs, 699
Carbone, E. See H. Gainer, 462
Carcinus, retinular cells in, 471
Carriker, M. R., P. Person, R. Libbin, and D. Van Zandt. Regeneration of the proboscis of muricid gastropods after amputation, with emphasis on the radula and cartilages, 317
Cartilage regeneration in gastropods, 317
Cassidy, J. D., O. P. and R. C. King. Ovarian development in *Habrobracon juglandis* (Ashmead) (Hymenoptera: Braconidae). I. The origin and differentiation of the oocyte-nurse cell complex, 483
Cell adhesion, sponge, 468
Cell interaction during fertilization in *Campanularia* 472
Cell surfaces in fish, 465
Cells, development from thalli of *Prasiola stipitata* of, 476
follicle, role during vitellogenesis in squid, 477
horizontal, of skate, 458
mammalian, effect of sea star coelomocytes on, 473
oocyte-nurse, origin of, 483
Cellular recognition mechanism in hydroids, 162
Central nervous system role in fly pupariation 127
Chaetognath, fertilization in, 207
Chaetopterus oocyte spindles, thermodynamics of, 474
Chaetopterus variapedatus response to osmotic stress 278
Chelonia mydas, chemoreception in, 184
Chemoreception, in sea turtles, 184
in shrimps, 94
Chemotactic response of bacteria to algae, 265
Chemotaxis, bacterial, 265
Chen, K. See H. Schuel, 476
Chromosome movement in *Tilia americana*, 462
Cilia, action of hydrostatic pressure on, 265
mussel, innervation of, 592
Ciliates, apostomatous, excystation of, 215
Circadian luciferase rhythms in *Gonyaulax*, 196
Circulation in crabs, 247
Clam, extrapallial fluid of, 506
Cleavage stages, ctenophore, segregation of developmental potential during, 461
Coelenterates, bioluminescence in, 470
respiratory adaptation of, 657
Coelomic fluid, ascidian, hemagglutinin in, 140
Coelomocyte, sea star, effect on mammalian cells, 473
Cohen, L. B. See H. V. Davila, 457; D. Landowne, 468; B. M. Salzberg, 475
Colcemid treatment of *Arbacia* eggs, 455
Compartmentation in *Hyalophora*, 367
Competition, coexistence of two holoplanktonic opisthobranchs, 392
Composition of molluscan extrapallial fluid, 506
Concanavalin A probing of sperm-egg interactions, 465
Convoluta roscoffensis, respiration and photosynthesis in, 420
Copper (II) effect on blue mussel, 679
Corneal stroma of dogfish, 457
Crab, horseshoe, amebocyte, aggregation of, 548
extra eyes in, 454

Crab ecdysis stimulated by limb loss, 222
oocytes, spider, uptake of vitellogenin, 463
water exchange, 234
Crabs, effects of fuel oil on, 475
hypoxia and circulation in, 247
spider, reproduction in, 358
Crayfish muscle fibers, skinned, stiffness of, 466
CREMER-BARTELS, G., AND Z. DISCHE. Two different pools of hexosaminoglycans in the corneal stroma of the dogfish, 457
CRENSHAW, M. A. The inorganic composition of molluscan extrapallial fluid, 506
CRIPPA, M. See C-H. SIU, 478
Crustacea heart response to hypoxia, 247
molting and reproductive cycles in, 568
reproduction in, 358
Ctenophore, segregation of developmental potential during cleavage stages in, 461
Cyanea capillata, toxins of, 617
Cycles, mitotic, in cleaving frog eggs, 699
Cytochalasin B delay of fertilization in *Arbacia*, 456
Cytochalasin B treatment of *Arbacia* eggs, 455
Cytokinesis, genetic control of, 525
Cytology of ovarian development in *Habrobracon juglandis*, 483

D

DAVENPORT, D. See B. W. ACHE, 94
DAVILA, H. V., B. M. SALZBERG, L. B. COHEN AND A. S. WAGGONER. Changes in fluorescence of squid axons during activity, 457
See B. M. SALZBERG, 475
DAW, N. W., AND A. L. PEARLMAN. Screening pigment migration in the squid, 457
Deuterium oxide, alteration of activity rhythms, 513
measurement of water exchange in crabs, 234
Development, embryonic, in *Arbacia*, 344
ovarian, in *Habrobracon juglandis*, 483
sea urchin, 478
of a parasitic anemone, 440
of *Arbacia* eggs, inhibition of, 474
of single cells from thalli of *Prasiola stipitata*, 476
Dextrality, reversal of, in shell of *Melampus*, 623
DIETERICH, A., AND K. NEALSON. A study of the survival of dark mutants of marine luminous bacteria under anaerobic conditions, 458
Differentiation of oocyte-nurse cell complex, 483
Dinoflagellates, marine, circadian rhythms in, 196
DISCHE, Z. See G. CREMER-BARTELS, 457
Dispersal, larval, in *Mytilus edulis*, 470
Distribution, spatial, of *Nucula*, 175
DNA polymerase activity in sea urchin development, 478
Dogfish, gout and tissue injury in, 480
plasma proteins in, 461
corneal stroma, 457
lens protein synthesis, inhibition of, 481
retina, enzymes in, 466
DOWLING, J. E., AND H. RIPPS. Effects of Mg^{2+} on skate horizontal cells: evidence for release of transmitter from receptors in darkness, 458
DOWSE, H. B., AND J. D. PALMER. The chronomutagenic effect of deuterium oxide on the period and entrainment of a biological rhythm, 513
DRISCOLL, E. G. Oxygen, salinity, pH and temperature variation in the bottom water of Buzzards Bay, 459
Drosophila melanogaster, studies on *fes* in, 525
DUNLAP, D. G. Latitudinal effects on metabolic rates in the cricket frog, *Acris crepitans:* acutely measured rates in summer frogs, 332

E

EBERHARD, A. Long term survival of bioluminescent bacteria in sea water, 459
See J. MAGNER, 469
EBERHARD, C. See T. PATT, 473
Ecdyses in Brachyura, 222
Ecdysone in fly pupariation, 127
Echinoderm eggs, developmental potential of, 479
EDTA, reversible inhibition of aggregation by, 548
EDWARDS, B. F., AND D. BARRETT. Comparative biochemistry of sea urchin hatching enzymes, 459
Egg-laying of *Melampus bidentatus*, 623
EHRENFELD, D. W. See M. MANTON, 184
Electrical stimulation, effect on reagents in squid axon, 469
Electron microscopy of fly germarium, 525
of mussel cilia, 592
Electrophoresis of *Cyanea* toxin, 617
of fish hemoglobins, 455
of gene-enzyme variation in *Littorina*, 455
Embryonic development in *Arbacia*, 344
Enzyme, role in fertliziation of sea urchin eggs, 476
inactivation by a tapeworm, 605
hatching, of sea urchins, biochemistry of, 459

Epifaunal sea anemones, respiratory adaptation of, 657
Eupleura caudata, regeneration in, 317
Excirolana chiltoni, molting and reproductive cycles in, 568
Excystation of apostomatous ciliates, 215
Extraction of *Cyanea* toxin, 617
Eyes, extra, in horseshoe crabs, 454

F

FARMANFARMAIAN, A., AND G. M. FARRELL. Cation gradient coupled transport of organic substrates—consideration of luminal and plasma sodium, intestine of toadfish *Opsanus tau in vivo*, 460
FARRELL, G. M. See A. FARMANFARMAIAN, 460
Feeding cycles in a crustacean, 568
Feeding of *Paedoclione* 392
FEIN, A. Early receptor potentials and the photochemical cycle of invertebrate photoreceptors, 460
Fertilization in *Arbacia*, delay of, 456
in *Campanularia* 472
in *Sagitta* 207
of sea urchin eggs, 464, 476
Fes in *Drosophila melanogaster*, 525
Fish, marine, lens epithelial cell surfaces in, 465
hemoglobins, electrophoresis of, 455
FISHMAN, L., H. SCHRIEBER, M. ORATZ, M. ROTHSCHILD AND S. S. SCHRIEBER. Plasma proteins in oncotically stressed dogfish, 461
See A. GROSSMAN, 464
Flatworm respiration and photosynthesis, 420
Fluid, extrapallial, composition in molluscs of, 506
Fluorescence, axon, change in, 475
histochemical, in mussel cilia, 592
Fluorescence of squid axons, 457
Fly pupariation, acceleration by hormones of, 127
FORWARD, R. B., JR., K. W. HORCH AND T. H. WATERMAN. Visual orientation at the water surface by the teleost *Zenarchopterus*, 112
FRAENKEL, G., J. ZDAREK AND P. SIVASUBRAMANIAN. Hormonal factors in the CNS and hemolymph of pupariating fly larvae which accelerate puparium formation and tanning, 127
FREEMAN, G., AND G. T. REYNOLDS. The segregation of developmental potential during early cleavage stages in the ctenophore *Mnemiopsis leidyi*, 461
FRISCH, H. L. See S. C. BROWN, 278
Frogs eggs, cleaving, mitotic cycles in, 699
Frogs, cricket, metabolic rate of, 332
FUKE, M. T., AND T. SUGAI. Studies on the naturally occurring hemagglutinin in the coelomic fluid of an ascidian, 140
Functional morphology of anemones, 657
Fundulus heteroclitus, oxygen consumption in embryonic shield of, 296
FUSELER, J. W. Unusual aspects of chromosome movement and phragmoplast formation in *Tilia americana*, 462

G

GAINER, H., E. CARBONE, I. SINGER, K. SISCO AND I. TASAKI. Identification of some membrane protein subunits obtained from the squid giant axon, 462
Gametes, sea urchin, effects of mercury salts on, 478
GANION, L. R., R. E. BAST AND R. A. WALLACE. The isolation and uptake of vitellogenin by spider crab oocytes *in vitro*, 463
Gastropoda, proboscis regeneration in, 317
temperature, water and respiratory regimes in, 304
Genetic control of cytokinesis, 525
Genetic information transfer in bacteria, 473
Genetic variation, in *Littorina*, 455
in *Mytilus*, 470
GILL, M. L., AND K. NEALSON. Isolation and host range studies of marine bacteriophage, 463
Gills, toadfish, structure and dimension, 150
Glucose release in insect fat body, 367
Glycolipid mannosyl transferases in dogfish retina, 466
Glycoprotein in dogfish retina, 466
Gonyaulax polyedra, circadian rhythms in, 196
GORDON, S. See C. V. HARDING, 465
GORMAN, A. L. F., AND J. S. MCREYNOLDS. Potassium dependence of the hyperpolarizing receptor potential of the scallop photoreceptor, 464
Gout in dogfish, 480
GRAHAM, D. E. See D. M. SKINNER, 222
GRAY, I. E. See G. M. HUGHES, 150
GROSSMAN, A., W. TROLL, M. LEVY, L. FISHMAN, G. WEISSMANN, J. LASKIN AND R. SOBERMAN. Release of protease activity from sea urchin eggs upon fertilization, 464
Growth response of bacteria to algae, 265

H

Habrobracon juglandis, ovarian development in, 483
Haemolymph trehalose in *Hyalophora*, regulation of, 367

Haloclava producta, respiratory adaptation of, 657
HAMBURGER, K. See E. ZEUTHEN, 699
HARDING, C. V., D. HARDING, V. PETERS, T. KUWABARA, J. REDDAN, N. UNAKAR, M. BAGCHI, T. SCHNUR AND S. GORDON. Lens epithelial cell surfaces in marine fish, 465
HARRIS, G. C. See J. A. SCHIFF, 476
HASTINGS, J. W. See L. McMURRY, 196
Heart rate, mussel, effect of copper on, 679
response to hypoxia in crustaceans, 247
HEIDGER, P. M., JR., R. G. SUMMERS AND J. A. MILLER, JR. Hyperbaric oxygen and embryonic development in *Arbacia punctulata*, 344
Hemagglutinin in ascidians, 140
Hemigrapsus nudus, measurement of water exchange in, 234
Hemoglobins, fish, electrophoresis of, 455
Hemolymph, flies, 127
Heterostrophy of shell in *Melampus*, 623
Hexosaminoglycans in corneal stroma of dogfish, 457
Hill, M. C. See G. S. TUCKER, 479
HINSCH, G. W. Some factors controlling reproduction in the spider crab, *Libinia emarginata*, 358
See J. W. SHAY, 478
Histo-incompatibility in hydroids, 162
HORCH, K. W. See R. B. FORWARD, JR., 112
Hormonal control of reproduction in spider crabs, 358
Hormones hastening fly pupariation, 127
Host-parasite relationships, 605
Host range studies of marine bacteriophage, 463
HOWE, C. W. S., AND C. B. METZ. Multivalent and univalent concanavalin A as probes for studying sperm-egg interactions, 465
HUGHES, G. M., AND I. E. GRAY. Dimensions and ultrastructure of toadfish gills, 150
HUNTER, R. D. See W. D. RUSSELL-HUNTER, 623
Hyalophora cecropia, regulation of haemolymph trehalose in, 367
Hyalophysa chattoni, excystation of, 215
Hydractinia echinata, histo-incompatbility of, 162
Hydroid histo-incompatibility, 162
Hydrostatic pressure, action on cilia, 256
Hymenolepis diminuta, enzyme inactivation by, 605
Hyperplastic growth of hydroids, 162
Hypoxia in crabs, 247

I

Infaunal sea anemones, respiratory adaptation of, 657
INOUE, S. *Arbacia* spermatozoa: plasma membrane "in rigor," 466
Insect detection of ionizing radiations, 403
fat body, sugar release in, 367
Ions, calcium, in avian myogenesis, 431
extracellular, effect on vertebrate retina, 473
Isolation of marine bacteriophage, 463
Isoosmotic volume-regulation in *Chaetopterus*, 278
Isopod, sand-beach, molting and reproductive cycles in, 568
Isotope effect in crab water exchange, 234
IVKER, F. B. A hierarchy of histo-incompatibility in *Hydractinia echinata*, 162

J

Jellyfish, toxins of, 617
JOHNSON, J. H., AND R. C. KING. Studies on *Fes*, a mutation affecting cystocyte cytokinesis, in *Drosophila melanogaster*, 525
JUNGREIS, A. M., AND G. R. WYATT. Sugar release and penetration in insect fat body: relations to regulation of haemolymph trehalose in developing stages of *Hyalophora cecropia*, 367

K

KAPLAN, E. See R. B. BARLOW, JR., 454
KARR, A. See M. MANTON, 184
KAWAI, M. Stiffness measurement of skinned muscle fibers at low frequency, 466
KEAN, E. L., W. E. BRUNER AND P. C. SHERWOOD. Glycoprotein and glycolipid mannosyl transferases of dogfish retina, 466
KENNEY, D. M., F. A. BELAMARICH AND D. SHEPRO. Aggregation of horseshoe crab (*Limulus polyphemus*) amebocytes and reversible inhibition of aggregation by EDTA, 548
KIMELDORF, D. J. See D. L. MARTINSEN, 403
KING, R. C. See J. D. CASSIDY, 483; J. H. JOHNSON, 525
KIRSCHENBAUM, D. M. What you can do with amino acid analyses, 467
KLAPOW, L. A. Fortnightly molting and reproductive cycles in the sand-beach isopod, *Excirolana chiltoni*, 568
KUSANO, K. See E. M. LANDAU, 467
KUWABARA, T. See C. V. HARDING, 465

L

LALLI, C. M. Food and feeding of *Paedoclione doliiformis* Danforth, a neotenous gymnosomatous pteropod, 392

LANDAU, E. M., AND K. KUSANO. Facilitation and depression of transmitter release in the squid giant synapse, 467

LANDOWNE, D., AND L. B. COHEN. The effect of temperature on the influx of sodium ions associated with nerve impulses in the perfused squid giant axon, 468

Larvae of strigeid trematodes in Woods Hole area, 479

Larval development of *Peachia quinque-capitata*, 440

LASKIN, J. See A. GROSSMAN, 464

Latitude, effect on cricket frogs, 332

LEGG, M. See J. A. SCHIFF, 476

LEITH, A. G., AND M. S. STEINBERG. Sponge cell adhesion: Velocity sedimentation and aggregative specificity of discrete cell types, 468

Lens crystallins in dogfish, 481

Lens epithelial cell surfaces in fish, 465

LEVINTON, J. Spatial distribution of *Nucula proxima* Say (Protobranchia): an experimental approach, 175

LEVY, M., AND W. TROLL. Binding of indicator anions by protamine and its use in a sensitive assay of protease, 468

See A. GROSSMAN, 464

LIBBIN, R. See M. R. CARRIKER, 317

Libinia emarginata, reproduction in, 358
oocytes, uptake of vitellogenin by, 463

Life cycle of a parasitic anemone, 440

Life-cycle synchrony in *Melampus*, 623

Limb loss stimulation of ecdysis in Brachyura, 222

Limulus, receptor potential in photoreceptors of, 460
photoreceptors, changes in $[Ca^{++}]_{in}$ of, 456
amebocytes, aggregation of, 548
extra eyes in, 454

Littorina, genetic variation in, 455

Loligo pealei, pigment migration in, 457
role of follicle cells during vitellogenesis, 477

LORAND, L. See H. SCHUEL, 476

Luciferase changes in *Gonyaulax*, 196
synthesis in bioluminescent bacteria, 469

M

MAGNER, J., A. EBERHARD AND K. NEALSON. Characterization of bioluminescent bacteria by studies of their inducers of luciferase synthesis, 469

MAJOR, C. W. See D. M. SCOTT, 679

MANGUM, C. P. See C. SASSAMAN, 657

MANTON, M., A. KARR AND D. W. EHRENFELD. Chemoreception in the migratory sea turtle, *Chelonia mydas*, 184

Marine benthos, spatial distribution of bivalves in, 175

MARQUIS, J. K., AND H. G. MAUTNER. The effect of electrical stimulation on the action of sulfhydryl reagents in the giant axon of squid, 469

MARTINSEN, D. L., AND D. J. KIMELDORF. The prompt detection of ionizing radiations by carpenter ants, 403

Maturation in spider crabs, 358

MAUTNER, H. G. See J. K. MARQUIS, 469

McMURRY, L., AND J. W. HASTINGS. Circadian rhythms: mechanism of luciferase activity changes in *Gonyaulax*, 196

McREYNOLDS, J. S. See A. L. F. GORMAN, 464

Melampus bidentatus, life-cycle synchrony in, 623

Membrane protein subunits in squid axon, 462

Metabolic rate of cricket frogs, 332

Metridium senile, respiratory adaptation of, 657

METZ, C. B. See C. W. S. HOWE, 465

MICHAEL, A. D. See D. M. SANDBERG, 475

Mice, D_2O alteration of activity rhythms of, 513

Microciona prolifera, cell adhesion in, 468

Microtubules in homogenates of *Spisula solidissima* oocytes, 480

MILKMAN, R., R. ZEITLER AND J. F. BOYER. Spatial and temporal genetic variation in *Mytilus edulis:* natural selection and larval dispersal, 470

MILLER, J. A., JR. See P. M. HEIDGER, JR., 344

MITCHELL, R. See W. BELL, 265

Mitosis of *Arbacia* eggs, inhibition of, 474

Mnemiopsis leidyi, segregation of developmental potential during cleavage stages, 461

Mollusc cilia, innervation of, 592

Molluscs, composition of extrapallial fluid of, 506

Molting cycles in *Excirolana chiltoni*, 568

Molting in spider crabs, hormonal control of, 358

MORIN, J. G., AND G. T. REYNOLDS. Spectral and kinetic characteristics of bioluminescence in *Pelagia noctiluca* and other coelenterates, 470

MOTE, M. I. Polarization sensitivity ratios of retinular cells in the crabs *Carcinus* and *Callinectes* under conditions of selective adaptation and dim stimuli, 471

Mounts, P. See R. F. Brunhouse, 456
Mus musculus, D_2O alteration of biological rhythms of, 513
Mussel, cilia, innervation of, 592
common blue, effect of copper on, 679
extrapallial fluid of, 506
Mustelus canis, inhibition of lens protein synthesis in, 481
Mutants, dark, of luminous bacteria, 458, 471
Myogenesis, avian, role of calcium ions in, 431
Mytilus edulis, cilia, innervation of, 592
effect of copper on, 679
electrophoresis of, 470

N

Nealson, K. Factors controlling the appearance of spontaneous dark mutants of luminous bacteria, 471
See A. Dieterich, 458; M. L. Gill, 463; J. Magner, 469; T. Patt, 473
Nematocyst discharge, 617
Neurosecretion in flies, 127
Nielsen, J. Protein synthetic rates in pyloric caecae of temperature acclimated starfish, *Asterias forbesi*, 472
Non-equilibrium thermodynamic approach to volume-regulation, 278
Nozawa, K., D. L. Taylor and L. Provasoli. Respiration and photosynthesis in *Convoluta roscoffensis* Graff, infected with various symbionts, 420
Nucula proxima, spatial distribution of, 175

O

Odontophore, regeneration of, 317
Oil, fuel, effect on amphipods and crabs, 475
Olmsted, J. B. See R. C. Weisenberg, 480
Oncotic stress, response of dogfish to, 461
Oocyte-nurse cell complex, origin of, 483
Oocyte spindles, *Chaetopterus*, thermodynamics of, 474
Oogenesis in *Habrobracon juglandis*, 483
Opisthobranchia, feeding of, 392
Opsanus tau, gill structure of, 150
sodium transport in intestine of, 460
O'Rand, M. G. A soluble cell surface material required for spermatozoan-epithelial cell interaction during fertilization in *Campanularia flexuosa*, 472
Oratz, M. See L. Fishman, 461
Organic components of sponge axial filament, 689
Orientation, visual, by *Zenarchopterus*, 112
Osmoregulation in crabs, 234
Osmotic responses of *Chaetopterus*, 278
Ovoviviparity in an isopod, 568
Oxygen, hyperbaric, in *Arbacia*, 344
balance in *Convoluta*, 420
consumption in cricket frogs, 332
consumption in embryonic shield of *Fundulus*, 296
consumption in *Pomacea*, 304
sensitivity of anemones, 657
tension, effect on squid axon of, 477
uptake in cleaving frog egg, 699
variation in bottom water of Buzzards Bay, 459
Oyster, extrapallial fluid of, 506
Ozawa, E. The role of calcium ion in avian myogenesis *in vitro*, 431

P

Pacheco, J. See A. J. Burky, 304
Paedoclione doliiformis, feeding of, 392
Palaemonetes, symbionts of, 125
Palmer, J. D. See H. B. Dowse, 513
Paparo, A. Innervation of the lateral cilia in the mussel, *Mytilus edulis* L., 592
Pappas, P. W., and C. P. Read. Inactivation of α- and β-chymotrypsin by intact *Hymenolepis diminuta* (Cestoda), 605
Parasitism as an index of molt frequency, 568
Patt, T., K. Nealson and C. Eberhard. Promiscuous transfer of genetic information from nonmarine to marine bacteria, 473
Peachia quinquecapitata, life cycle of, 440
Pearlman, A. L. See N. W. Daw, 457
Pecten irradians, potassium dependence of photoreceptors of, 464
Pelagia noctiluca, bioluminescence of, 470
Pereyra, E. See A. J. Burky, 304
Periodicity, semilunar, in life cycle of *Melampus bidentatus*, 623
Person, P. See M. R. Carriker, 317
Peters, V. See C. V. Harding, 465
pH variation in bottom water of Buzzards Bay, 459
Photoreceptors, invertebrate, potential and photochemical cycle of, 460
Limulus, changes in $[Ca^{++}]_{in}$ of, 456
Photosynthesis in *Convoluta* 420
Phragmoplast formation in *Tilia americana*, 462
Pigment migration in squid, 457
Pinto, L. H., and J. E. Brown. Effects of changing extracellular ions on photoreceptor potentials in an isolated, perfused vertebrate retina, 473
Plasma membrane of *Arbacia* spermatozoa, 466
Plasma proteins in dogfish, 461
Polarized light perception, 112

Pomacea urceus, temperature, water and respiratory regimes of, 304
Potassium concentration in squid axon, 454
dependence in scallops, 464
POWELL, W. A. See N. E. RICE, 617
Prasiola stipitata thalli, development of cells from 476
PRENDERGAST, R. A. Effect of sea star coelomocyte extract on mammalian immunocompetent cells, 473
Pressure studies on cilia, 256
PRITCHARD, A. W. See D. F. STIFFLER, 247
Proboscis regeneration in gastropods, 317
Protamine, binding of anions by, 468
Protease, assay of, 468
release from sea urchin eggs of, 464
Protein synthesis in starfish, 472
analysis of, 467
Protozoan symbionts of Crustacea, 215
PROVASOLI, L. See K. NOZAWA, 420
Pupariation in flies hastened by hormones, 127

Q

QUATRANO, R. S. See J. A. SCHIFF, 476

R

Radiation, beta-, detection in ants, 403
Radula regeneration in gastropods, 317
Rana platyrrhina, mitotic cycles in cleaving eggs of, 699
READ, C. P. See P. W. PAPPAS, 605
Receptors, skate, release of transmitter from, 458
REDDAN, J. See C. V. HARDING, 365
REEVE, M. R., AND M. A. WALTER. Observations and experiments on methods of fertilization in the chaetognath *Sagitta hispida*, 207
Regeneration, in sea urchins, 256
of gastropod proboscis, 317
Reproduction in spider crabs, 358
Reproductive cycles in *Excirolana chiltoni*, 568
Respiration, mussel, effect of copper on, 679
in *Convoluta*, 420
Respiratory adaptation of anemones, 657
surface of toadfish gills, 150
Retina, dogfish, enzymes in, 466
vertebrate, effect of changing extracellular ions on, 473
cells in crabs, 471
REYNOLDS, G. T., P. BOTOS, JR. AND R. BARBA. A spectroscope image intensification system for recording *in vivo* spectra of bioluminescent organisms, 474
REYNOLDS, G. T. See G. FREEMAN, 461; J. G. MORIN, 470
Rhythms, biological, D_2O alteration of, 513
circadian, in *Gonyaulax*, 196
RICE, N. E., AND W. A. POWELL. Observations on three species of jellyfishes from Chesapeake Bay with special reference to their toxins. II. *Cyanea capillata*, 617
RIPPS, H. See J. E. DOWLING, 458
ROTHSCHILD, M. See L. FISHMAN, 461
RUDY, P. P. See R. I. SMITH, 234
RUSSELL-HUNTER, W. D., M. L. APLEY AND R. D. HUNTER. Early life-history of *Melampus* and the significance of semilunar synchrony, 623
RUSTAD, R. C., B. C. ANTONELLIS AND S. ZIGMAN. A near ultraviolet photoproduct of tryptophan inhibits the mitosis and development of *Arbacia* eggs, 474
See A. M. BELANGER, 455

S

Sagitta hispida, fertilization in, 207
Salinity variation in bottom water of Buzzards Bay, 459
SALMON, E. D. Thermodynamics of living *Chaetopterus* oocyte spindles—polarizing microscope measurements with a new hydrostatic pressure chamber, 474
Salt marshes, *Melampus bidentatus* in, 623
Salts, mercury, effect on sea urchin gametes of, 478
SALZBERG, B. M., H. V. DAVILA, L. B. COHEN AND A. S. WAGGONER.. A large change in axon fluorescence, potentially useful in the study of simple nervous systems, 475
See H. V. DAVILA, 457
SANDBERG, D. M., A. D. MICHAEL, B. BROWN AND R. BEEBE-CENTER. Toxic effects of fuel oil on haustoriid amphipods and pagurid crabs, 475
Sarcophaga bullata pupariation, 127
SASSAMAN, C., AND C. P. MANGUM. Adaptations to environmental oxygen levels in infaunal and epifaunal sea anemones, 657
Scallop photoreceptors, potassium dependence of, 464
SCHAUER, R. V. Excystation of the apostomatous ciliate, *Hyalophysa chattoni*, without metamorphosis, 215
SCHIFF, J. A., R. S. QUATRANO, G. C. HARRIS, M. LEGG AND J. STALEY. Development of single cells from mechanically-disrupted thalli of *Prasiola stipitata* Suhr, 476
SCHNUR, T. See C. V. HARDING, 465
SCHRIEBER, H. See L. FISHMAN, 461

SCHUEL, H., L. LORAND, K. CHEN AND W. L. WILSON. A trypsin-like enzyme in cortical granules of sea urchin eggs, and its role in fertilization, 476
Scintillons in *Gonyaulax*, a marine dinoflagellate, 196
SCOTT, D. M., AND C. W. MAJOR. The effect of copper (II) on survival, respiration, and heart rate in the common blue mussel, *Mytilus edulis*, 679
Sea star coelomocyte, effect on mammalian cells, 473
SEDENSKY, M. See C-H. SIU, 478
Selection, natural, in *Mytilus edulis*, 470
SELMAN, K., AND R. A. WALLACE. A role for the follicle cells during vitellogenesis in the squid *Loligo pealei*, 477
Semilunar periodicity in life cycle of *Melampus bidentatus*, 623
SENFT, J. P. See W. J. ADELMAN, JR., 454
Sensory physiology of shrimps, 94
SHANKLIN, D. R., S. A. STEIN, D. THOMPSON AND J. BANKS. Effects of varied oxygen tension on properties of excised squid giant axon, 477
SHAY, J. W., AND G. W. HINSCH. The effects of mercury salts on sea urchin gametes, 478
SHEPRO, D. See D. M. KENNEY, 548
SHERWOOD, P. C. See E. L. KEAN, 466
SHORE, R. E. Axial filament of silicious sponge spicules, its organic components and synthesis, 689
Shrimp host recognition, 94
SINGER, I. See H. GAINER, 462
Sinistrality, reversal of, in shell of *Melampus*, 623
SISCO, K. See H. GAINER, 462
SIU, C-H., M. SEDENSKY AND M. CRIPPA. RNA-directed DNA polymerase activity in sea urchin development, 478
SIVASUBRAMANIAN, P. See G. FRAENKEL, 127
Skate horizontal cells, 458
SKINNER, D. M., AND D. E. GRAHAM. Loss of limbs as a stimulus to ecdysis in Brachyura (true crabs), 222
SMITH, R. I., AND P. P. RUDY. Water-exchange in the crab *Hemigrapsus nudus* measured by use of deuterium and tritium oxides as tracers, 234
Snail, amphibious, temperature, water and respiratory regimes in, 304
SOBERMAN, R. J. See A. GROSSMAN, 464; G. WEISSMANN, 480
Sodium ions in squid axon, effect of temperature on, 468
transport in toadfish, 460
SPAULDING, J. G. The life cycle of *Peachia quinquecapitata*, an anemone parasitic on medusae during its larval development, 440
Spectroscope, recording of bioluminescent organisms by, 474
Sperm-egg interactions in *Arbacia*, 465
Spermatozoa, *Arbacia*, plasma membrane, 466
Spicules, sponge, axial filaments of, 689
Spisula solidissima oocytes, homogenates of, 480
Sponge cell adhesion, 468
spicule axial filament, 689
Squid, pigment migration in, 457
role of follicle cells during vitellogenesis in, 477
Squid axon, effect of oxygen tension on, 477
effect of temperature on sodium ions in, 468
membrane protein subunits in, 462
potassium concentration in, 454
sulfhydryl reagents in, 469
fluorescence of, 457
synapse, transmitter release in, 467
STALEY, J. See J. A. SCHIFF, 476
Starfish, temperature acclimation in, 472
STEIN, S. A. See D. R. SHANKLIN, 477
STEINBERG, M. S. See A. G. LEITH, 468
STIFFLER, D. F., AND A. W. PRITCHARD. A comparison of *in situ* and *in vitro* responses of crustacean hearts to hypoxia, 247
Stiffness of skinned crayfish muscle fibers, 466
Strongylocentrotus purpuratus cilia, pressure action on, 256
STUNKARD, H. W. Larvae of strigeid trematodes in the Woods Hole area, 479
Styela plicata, hemagglutinin in, 140
Sucrose release in insect fat body, 367
SUGAI, T. See M. T. FUKE, 140
Sugar release in insect fat body, 367
SUMMERS, R. G. See P. M. HEIDGER, JR., 344
Sun-compass orientation in teleosts, 112
Survival, mussel, effect of copper on, 679
of bioluminescent bacteria in sea water, 459
Symbionts of *Palaemonetes*, 215
Symbiosis, algal-invertebrate, 420
shrimp, 94
Synapse, squid, transmitter release in, 467
Synchrony, life-cycle, in *Melampus*, significance of, 623
Synthesis of sponge axial filament, 689

T

Tanning (flies) accelerated by hormones, 127
Tapeworm, enzyme inactivation by, 605
TASAKI, I. See H. GAINER, 462
Taxis (menotaxis) in *Zenarchopterus*, 112
TAYLOR, D. L. See K. NOZAWA, 420

Teleost embryology, 296
visual orientation, 112
Temperature, effect on sodium ions in squid, 468
acclimation in starfish, 472
regime in *Pomacea*, 304
variation in bottom water of Buzzards Bay, 459
Thermodynamics of living *Chaetopterus* oocyte spindles, 474
THOMPSON, D. See D. R. SHANKLIN, 477
Tilia americana, chromosome movement and phragmoplast formation in, 462
Time compensated menotaxis in teleosts, 112
Tissue injury in dogfish, 480
Tissue respiration in teleost gastrulae, 296
Toadfish, sodium transport in, 460
gill areas and structure, 150
Toxicity experiments of nematocysts, 617
Toxin of *Cyanea capillata*, 617
Transmitter release in squid giant synapse, 467
Trehalose, regulation in *Hyalophora*, 367
Trematodes, strigeid, larvae in Woods Hole area, 479
Tritium oxide measurement of water exchange in crabs, 234
TROLL, W. See A. GROSSMAN, 464; M. LEVY, 468
Tryptophan inhibition of *Arbacia* egg development, 474
Tryptophan inhibition of dogfish lens protein synthesis, 481
TUCKER, G. S., M. C. HILL AND C. R. WYTTENBACH. Differential developmental potential of echinoderm eggs in sea water from various sources in and near the Marine Biological Laboratory, Woods Hole, 479
Turtle, sea, chemoreception in, 184

U

Ultrastructure of fly germarium, 525
of ovarian development in *Habrobracon juglandis*, 483
of toadfish gills, 150
UNAKAR, N. See C. V. HARDING, 465
Urchin, sea, development, DNA polymerase activity in, 478
eggs, fertilization of, 476
eggs, release of protease activity from, 464
gametes, effects of mercury salts on, 478
hatching enzymes, biochemistry of, 459
action of hydrostatic pressure on, 256
Urosalpinx cinerea, regeneration in, 317

V

VAN ZANDT, D. See M. R. CARRIKER, 317
Veliger larvae of *Melampus bidentatus*, 623
VERNBERG, W. B. See A. R. BRUMMETT, 296
Vitellogenesis, role of follicle cells in the squid in, 477
Vitellogenin uptake by spider crab oocytes, 463

W

WAGGONER, A. S. See H. V. DAVILA, 457; B. M. SALZBERG, 475
WALLACE, R. A. See L. R. GANION, 463; K. SELMAN, 477
WALTER, M. A. See M. R. REEVE, 207
Water exchange in crabs, 234
loss in *Pomacea*, 304
permeability in crabs, 234
WATERMAN, T. H. See R. B. FORWARD, JR., 112
WEISENBERG, R. C., G. G. BORISY AND J. B. OLMSTED. Assembly of microtubules and aster-like structures in homogenates of *Spisula solidissima* oocytes, 480
WEISSMANN, G., AND R. J. SOBERMAN. Metchnikoff revisited: introducing the dogfish to gout and tissue injury, 480
See A. Grossman, 464
WILSON, W. L. See H. SCHUEL, 476
Woods Hole area, larvae of strigeid trematodes in, 479
Worm response to osmotic stress, 278
WYATT, G. R. See A. M. JUNGREIS, 367
WYTTENBACH, C. R. See G. S. TUCKER, 479

X

X-ray detection by carpenter ants, 403

Y

YULO, T. See S. ZIGMAN, 481
YOUNG, P. G., A. D. YOUNG AND A. M. ZIMMERMAN. Action of hydrostatic pressure on sea urchin cilia, 256

Z

ZDAREK, J. See G. FRAENKEL, 127
ZEITLER, R. See R. MILKMAN, 470
Zenarchopterus, visual orientation by, 112
ZEUTHEN, E., AND K. HAMBURGER. Mitotic cycles in oxygen uptake and carbon dioxide output in the cleaving frog egg, 699
ZIGMAN, S., AND T. YULO. How near UV photo-products of tryptophan inhibit dogfish *Mustelus canis* lens protein synthesis, 481
See R. C. RUSTAD, 474
ZIMMERMAN, A. M. See P. G. YOUNG, 256
Zooplankton, feeding of, 392